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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/558,893	10/13/2006	Michael Huth	2003P06127WOUS	6326

22116 7590 06/23/2010  
SIEMENS CORPORATION  
INTELLECTUAL PROPERTY DEPARTMENT  
170 WOOD AVENUE SOUTH  
ISELIN, NJ 08830

EXAMINER
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SUNG, GERALD LUTHER

ART UNIT	PAPER NUMBER
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3741

MAIL DATE	DELIVERY MODE
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06/23/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/558,893	<b>Applicant(s)</b> HUTH ET AL.	
	<b>Examiner</b> GERALD L. SUNG	<b>Art Unit</b> 3741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 10-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This is a non-final office action in response to the arguments and amendments filed in the Request for Continued Examination filed on 9 June 2010.

#### ***Response to Arguments***

2. The Applicant has presented amendments reciting "a longer side of the flow element abuts the combustion chamber wall" and argues such a recitation excludes the Senior reference. The Examiner respectfully disagrees. Initially, the broadest reasonable definition of "abuts" is "to be adjacent to" which indicates that an entirety of the flow element may be adjacent to the combustor wall and therefore every side of the flow element "abuts" the combustor wall. The Applicant appears to intend that a longer side of the flow element is adjacent to and in contact with the combustion chamber wall. However, this still does not exclude the Senior reference. It is noted that the "flow element" of Senior is substantially triangular where a plurality of substantially rectangular planes forms the substantially triangular shape. Therefore, it is submitted that every single side of the "flow element" of Senior has at least a portion of its plane in contact with the combustion chamber wall. Therefore, to properly exclude the Senior reference, the claims must specify a limitation such as, (for example only), "a longer side of the flow element is adjacent and in contact with the combustion chamber wall such that the longer side is defined/encompassed by a plane that is (substantially) parallel to and encompasses the combustion chamber wall."

3. The Examiner has included an additional rejection that further encompasses the Applicant's claims as broadly claimed.

6. Regarding claims 10 and 19, Senior discloses a high efficiency heat transfer structure comprising a combustion chamber wall 10, a liner 6 formed from a plurality of heat shields (see column 4 lines 25-27, reference to combustion chamber walls) on an inside of the combustion chamber wall, an inner space 12 formed between the heat shield elements and the combustion chamber wall and exposed to a cooling medium (air), a flow element 14a arranged in the inner space for selective adjustment of a cooling stream, the flow element 14a arranged on the combustion chamber wall 10. The

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entirety of the flow element 14a abuts the combustion chamber wall including the longest side of the flow element.

7. Regarding claims 11 and 21, the flow element is capable of causing a flow velocity of the cooling medium stream to be increased compared with the upstream velocity. The Examiner notes that the velocity will be largely proportional to the density, velocity and area at the particular points of interest where below flow choking regimes the flow element 14 is certainly capable of increasing the cooling medium velocity.

8. Regarding claims 12 and 23, the liner 6 is comprised of a plurality of wall where the combustion chamber wall 10 has a plurality of flow elements 14 that are spaced about the entire combustor. Therefore, it can be said that each liner wall ('herein heat shield') is assigned a respective flow element for the purposes of cooling a thermally loaded wall section of the heat shield element.

9. Regarding claims 13 and 24, the heat shield element is a single-shell hollow vessel with a cavity that the flow element is disposed about.

10. Regarding claim 14, the heat shield element has a surface region with a surface contour curved along the longitudinal and transverse axes where the combustion chamber being either circular or annular would necessarily be curved in such a manner.

11. Regarding claim 15, as broadly claimed, the flow element being attached to the combustion chamber wall 10 must inherently be attached by some "mechanical latching element" the devices being mechanical devices and secured to the wall. In the particular case, the flow element may be spot-welded into place.

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12. Regarding claim 16, the flow elements are detachably connected to the wall 10 via spot welding where the spot welds need only be removed to remove the flow elements 14.

13. Regarding claims 17-18, the flow elements may be made from strips of sheet metal.

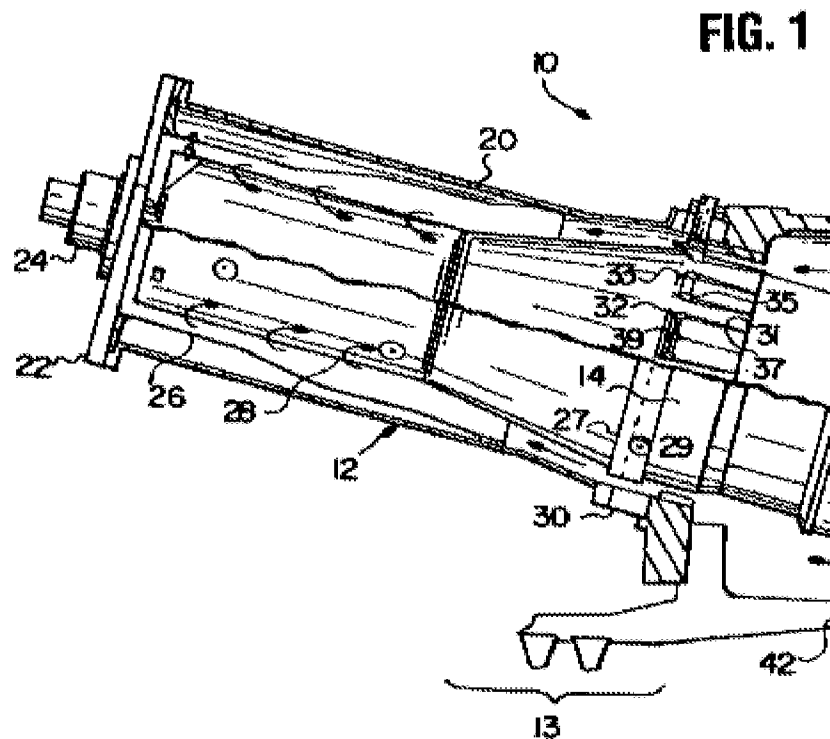
14. Regarding claim 20, the flow element comprises a surface located near a cold side of the heat shield 6 such that the flow channel becomes more narrow, the surface contour of the surface is adapted to match the surface contour of the cold side of the heat shield element in the circumferential direction.

15. Regarding claim 22, referring to figure 4, the flow element has a rectangular cross section where the surface forms the longer side of the rectangle.

16. Regarding claim 25, referring to figure 4, the axial cross section is approximately triangular in shape and the surface forms the longer side of the triangle.

17. Regarding claim 26, the surface is approximately parallel to the cold surface of the heat shield element.

18. Claims 10-13 and 19-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Beebe et al. US 5,826,429.



19. Regarding claims 10-13, 19-26, Beebe discloses a combustion chamber wall 20, a liner formed from a plurality of heat shields 28 on a radial inside of the combustion chamber wall, an inner space formed between the heat shield elements and the combustion chamber wall and exposed to a cooling medium (air), a flow element 26 ('sleeve') arranged in the inner space capable of selective adjustment of a cooling medium stream, the flow element arranged on the combustion chamber wall, wherein the longest side of the flow element abuts the combustion chamber wall. Conserving mass dictates the flow element will cause an increase in the velocity of the cooling air when compared to the downstream velocity, at least in the incompressible regime. The heat shield at the head of the combustor is interpreted as being "assigned" to the flow element 26 and will inherently have a higher cooling efficiency than without the flow

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element. The heat shield 28 is annular and is curved with respect to both the longitudinal axis of the combustor and the transverse axis of the combustor. The surface of the flow element is located near a cold side of the heat shield so as to reduce the flow channel width and a portion of the flow element surface matches the contour of the heat shield element. The flow element 26 has a rectangular shaped portion at the head of the combustor where the longer side forms a portion of the surface and an approximately triangular shaped portion upstream of the rectangular portion.

***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

22. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beebe and Senior.



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23. Regarding claims 15-18, Beebe discloses all elements but does not explicitly disclose the manner in which the flow element 26 is attached to the combustion chamber wall or the material composition of the flow element.

24. The use of welding and sheet metal components are well known in the field of gas turbine engines as shown by Senior. Combustors typically use various metals, metal alloys, or ceramics to form walls so as to withstand the high temperatures and pressures within the combustor. Welding offers a simple strong means of attaching structures with gas turbines.

25. One of ordinary skill in the art at the time of the invention would have found it obvious to weld a sheet metal flow element 26 to the combustor wall as a means of mounting the flow element to the wall of Beebe as taught by Senior in order to provide a durable effective means of mounting the flow element. Furthermore, as noted above, welds are reversible and therefore the flow element is detachably mounted.

#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD L. SUNG whose telephone number is (571)270-3765. The examiner can normally be reached on M-F 9am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cuff can be reached on (571) 272-6778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gerald Sung  
Patent Examiner  
GS  
17 June 2010

/Michael Cuff/  
Supervisory Patent Examiner, Art Unit 3741